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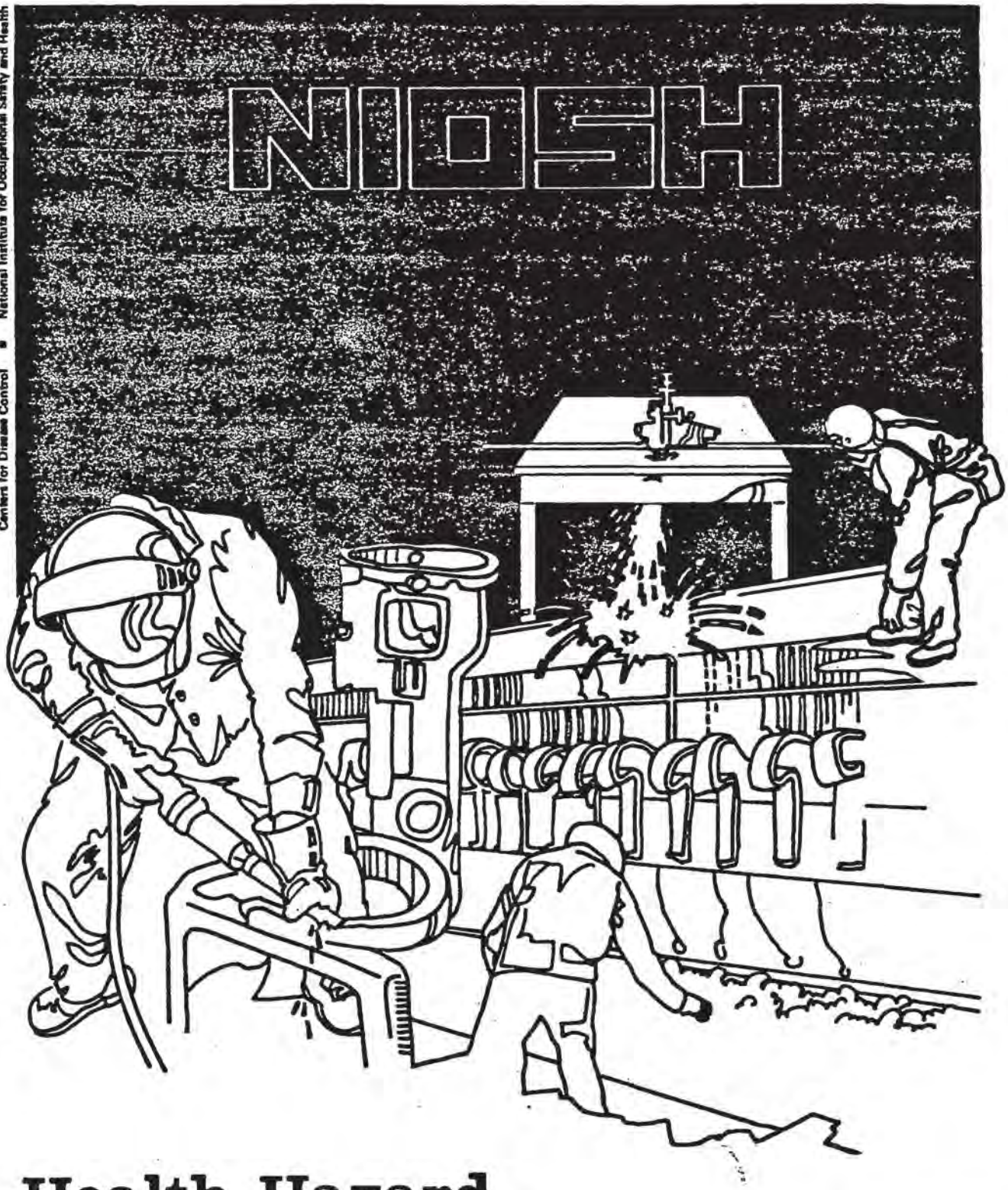

Health Hazard Evaluation Report

HETA 81-297-1116
U.S. POSTAL SERVICE
WASHINGTON BULK MAIL CENTER
WASHINGTON, D.C.

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HETA 81-297-1116
May 1982
U.S. Postal Service
Washington Bulk Mail Center
Washington, D.C.

NIOSH INVESTIGATORS:
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I. SUMMARY

On May 4, 1981, the National Institute for Occupational Safety and Health (NIOSH), received a request from the U.S. Postal Service to evaluate worker exposures to asbestos and other potential health hazards at the Washington Bulk Mail Center. A preliminary evaluation was conducted on July 9, 1981. The follow-up environmental study was conducted on August 3-4, 1981.

Ten exposure determinations for respirable particulates (nuisance dust) showed air concentrations which ranged from 0.03 to 0.18 mg/M^3, as compared to the OSHA standard or survey criteria of 5.0 mg/M^3. Twelve exposure determinations for asbestos showed air concentrations which were below the laboratory limit of quantitation for each sample. Sound pressure level measurements taken throughout the facility indicated a maximium of 85-86 dBA for any one location. OSHA permits a time weighted average (TWA) exposure level of 90 dBA for an 8-hour day. NIOSH recommends a maximum TWA exposure of 85 dBA for an 8-hour day.

By comparisons with the survey evaluation criteria, it is concluded that hazardous exposures to nuisance dusts, asbestos, or noise, were not occurring at the bulk mail center at the time of the survey. However, since the brake and clutch linings contain asbestos and since OSHA's "action" level for noise exposures is 85 dBA, several recommendations are offered in this report.

KEYWORDS: SIC 4311 (U.S. Postal Service), asbestos, noise, respirable particulates, nuisance dust

II. INTRODUCTION

On May 4, 1981, the Hazard Evaluations and Technical Assistance Branch of NIOSH received a request from the U.S. Postal Service to evaluate worker exposures to asbestos and other potential health hazards at the Washington Bulk Mail Center. The request was prompted because five cases of cancer had been reported among maintenance employees between February 1976 and February 1981. Since the maintenance mechanics replace asbestos-containing brake linings and clutch assemblies on the mechanical equipment, there was concern about the degree of exposure to asbestos.

An opening conference with management and a preliminary evaluation of the facility was conducted on July 9, 1981. The follow-up environmental study and review of personnel files were conducted on August 3-4, 1981.

III. BACKGROUND

The Washington Bulk Mail Center has been operating since August 16, 1975, handling packaged mail. The system is primarily automated, employing about 800 employees including 130 maintenance and custodial personnel operating on a 24 hour daily schedule. The process building occupies 378,004 square feet with the adjacent administration building occupying 19,536 square feet. The mail processing facility has a 45 foot high ceiling.

This facility receives packages from Maryland, West Virginia, and the Washington, D.C. area. General equipment includes the following:

Type	Total Length	Number
Parcel Sorters	5,540 feet	4
Sack Sorters	2,122 feet	2
General Conveyors	27,663 feet	-
Towveyor Loops	5,580 feet	4

This facility processed a mail volume during 1980 of the following amounts:

Type	Number
Primary Parcels	59,235,000
Secondary Parcels	24,108,000
Sacks	17,918,000
Non-Machineable Parcels	5,457,000
Irregular Parcel Post	5,884,000
	112,602,000

Sacks containing parcels are received by truck at the North and South Outbound Docks where they are unloaded by placing the arriving sacks of parcels on moving conveying belts that are advanced into the truck as it empties. These sacks are subsequently emptied of the incoming parcels, sorted, and re-routed to the various locations for eventual delivery. The majority of the system is computer controlled from one central location. Operator stations are located throughout the facility to speed the work during some of the process steps. These stations are primarily located at the sack and parcel sorting operations.

Maintenance people keep the process equipment operating continuously. This activity requires the replacement of asbestos brake shoes on electric motors that are utilized to stop and start the mail conveyor and parcel sorting systems.

Approximately 10% make-up (fresh) air is provided to both buildings, regardless of season of year. It is estimated that the buildings undergo two to three air changes per hour. Both buildings are under positive pressure.

IV. EVALUATION METHODS

On the basis of the preliminary evaluation it was decided to conduct air sampling for asbestos and respirable particulates (nuisance dust) and measure noise levels in a number of locations.

All air samples for asbestos and respirable particulates were personal samples. That is, the worker wore the sampling device for the duration of the sampling. The air samples for asbestos were collected on 37mm open-faced membrane filters at flow rates of 1.5 liters per minute (lpm) and were analyzed by phase contrast microscopy (NIOSH Method P&CAM 239). The air samples for respirable particulates were collected using 10mm nylon cyclones and 37mm closed-face membrane filters at flow rates of 1.7 lpm and were analyzed by electrobalance (NIOSH Method #29-1).

All sound pressure measurements were taken with a General Radio Model 1565-B Sound Level Meter operating on the "A" weighting network (slow response).

V. EVALUATION CRITERIA

The current OSHA standard for asbestos is 2.0 fibers greater than 5um in length per cubic centimeter of air (fibers/cc) determined as a time weighted average (TWA) for an 8-hour work shift. The criteria used for this study is the NIOSH recommendation of 0.1 fibers/cc determined as an 8-hour TWA. The primary health effects of exposure to asbestos are asbestosis, lung cancer, and mesothelioma.

The current OSHA standard for respirable particulates (nuisance dust) is 5.0 mg/M^3 determined as an 8-hour TWA. The criteria used for this study is the OSHA standard. Although the principal health effects of exposure to nuisance dusts are upon the pulmonary system, these dusts do not produce significant toxic effects when exposures are kept under reasonable control.

OSHA's noise standard specifies a permissible noise exposure level of 90 dBA for a duration of 8 hours, with higher levels allowed for shorter durations. NIOSH recommends a limit of 85 dBA, 5 dB less than the OSHA standard. The evaluation criteria for this study is the NIOSH recommendation.

Time-weighted average noise limits as a function of exposure duration are shown below:

Duration of Exposure (hrs/day)	Sound Level, dBA	
	NIOSH	OSHA
16	80	-
8	85	90
4	90	95
2	95	100
1	100	105
1/2	105	110
1/4	110	115*
1/8	115	-
	-	140 dB**

* No exposure to continuous noise above 115 dBA.

** No exposure to impact or impulse noise above 140 dB peak sound pressure level (SPL).

Exposure to high levels of noise may cause temporary or permanent hearing loss. The extent of damage depends primarily upon the intensity of the noise and the duration of the exposure.

VI. RESULTS - DISCUSSION

The results of the air sampling for respirable particulates or nuisance dust (Table 1) show air concentrations which ranged from 0.03 mg/M^3 to 0.18 mg/M^3 with a mean of 0.09 mg/M^3. Since all of these results are well below the evaluation criteria of 5.0 mg/M^3, it is concluded that hazardous exposures because of this dust did not exist at the time of the survey.

The results of the air sampling for asbestos fibers (Table 2) show air concentrations which were non-detectable at the laboratory limit of quantitation. For the air sample results as presented in Table 2, the limit of quantitation would be less than 0.02 fibers/cc. These results indicate that hazardous exposures did not exist at the time of the survey. However, since asbestos is a carcinogen, and the brake shoe and clutch plate linings do apparently contain asbestos, it is reasonable to make recommendations as regards this potential exposure.

The sound pressure level measurements (Table 3) show that in several locations the sound pressure level was 85-86 dBA. Employee exposure in these areas should be limited to 7.5 hours per day, as judged by the evaluation criteria (NIOSH). None of the noise levels exceeded the OSHA legal standard of 90 dBA for an 8-hour allowable daily exposure. The OSHA noise standard has recently been expanded with a hearing conservation amendment. For workers exposed at or above a TWA of 85 dBA for an 8-hour workday, the amendment will require noise exposure monitoring, audiometric testing, the use of hearing protective devices where necessary, and employee education. Although the sound pressure levels in the bulk mail center do not indicate a hazard by either the NIOSH recommendation or the OSHA legal standard, there may be certain employees for whom the OSHA noise amendments would apply.

The ventilation provisions for the process building and the administration building exceed the recommendations of the American Conference of Governmental Industrial Hygienists and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers.

Since the bulk mail center began operation in 1975, and since most types of cancer in adults are thought to take several years to develop to a stage where they are recognized, it is unlikely that the cancers among employees of the center, especially the earlier cases, can be attributed to work conditions at the center

VII. RECOMMENDATIONS

A. Brake and clutch assemblies should be cleaned of dust by using an industrial type vacuum cleaner equipped with a high efficiency filter system (> 99% efficiency for 0.3 um diameter aerosols). Compressed air or "dry" brushing should not be used. All asbestos waste should be disposed of in accordance with the OSHA asbestos regulation.

B. Because of the carcinogenic potential of asbestos, air purifying respirators as approved by NIOSH for asbestos exposures, might be used during brake and clutch replacement procedures.

C. The postal workers should be monitored to determine their TWA noise exposures. If their exposures exceed the OSHA standard, feasible engineering or administrative controls must be implemented to reduce exposures to permissible levels. For workers exposed at or above a TWA of 85 dBA, OSHA's hearing conservation amendment will require noise exposure monitoring, audiometric testing, the use of hearing protective devices where necessary, and employee education.

VIII. AUTHORSHIP/ACKNOWLEDGEMENTS

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IX. DISTRIBUTION AND AVAILABILITY OF REPORT

Copies of this report are currently available, upon request, from NIOSH, Division of Standards Development and Technology Transfer, Publications Dissemination, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia 22161.

Copies of this report have been sent to:

1. Manager, Occupational Safety and Health, U.S. Postal Service, Philadelphia.
2. Manager, Washington Bulk Mail Center.
3. Administrative Office, American Postal Worker's Union, Washington Bulk Mail Center.
4. Administrative Office, National Post Office Mail Handlers, Watchmen, and Group Leaders, Division of the Laborers International Union of North America, Washington Bulk Mail Center
5. U.S. Department of Labor, OSHA, Region III.
6. U.S. Department of Health and Human Services, NIOSH, Region III.

For the purpose of informing the affected employees, copies of this report shall be posted by the employer in a prominent place accessible to the employees for a period of 30 calendar days.

Table 1
Results of Personal Air Samples for Respirable Nuisance Dust (Particulates)
April 3, 1981

Sample Time	Job or Work Location	Respirable Particulates (mg/M^3)
0811-1530	Maintenance	0.13
0810-1535	Maintenance	0.07
0808-1539	Maintenance	0.03
0806-1526	Maintenance	0.09
0913-1153	Loading-South Outbound Docks	0.18
1159-1722	Shake-Out	0.04
0920-1720	Loose In-Mail	0.04
0915-1248	Loading-Inbound Docks	0.08
0922-1159	PSM-3	0.07
1300-1726	Sack Keyer	0.13
Evaluation Criteria (ACGIH)		5.0
Legal Standard (OSHA)		5.0

Table 2
Results of Personal Air Samples for Asbestos Fibers

Sample Time	Job or Work Location	Asbestos (fibers/cc)*
0740-1528	Maintenance	nd**
0742-1542	Maintenance	nd
0744-1550	Maintenance	nd
0745-1527	Maintenance	nd
0816-1540	Maintenance	nd
0817-1536	Maintenance	nd
0931-1526	Empty Sack Mail	nd
0928-1717	North Outbound Mail	nd
0901-1704	Sack Sorter	nd
0910-1706	Clerk-Route Sort	nd
0914-1705	Mail Handler	nd
0915-1600	Floor Maintenance	nd
Evaluation Criteria - exposures should be minimized.		0.1
OSHA Standard (8-hour average daily exposure)		2.0

* Fibers greater than 5 microns in length per cubic centimeter of air.

** nd means none detected at laboratory limit of quantitation

Table 3
Results of Noise Measurements

Sample Location	Sound Pressure Levels (dBA)	Allowable Exposure Based on Survey Criteria (NIOSH) (hours/day)
PACU/SACU	85	8
Inbound Docks	80	16
Weight + Acceptance	85-86	7.5
North Outbound Docks	85-86	7.5
South Outbound Docks	84-85	8
CPO Belt	79-80	16
NMO Area	79	16
Route Sort	84-85	8
East Outbound Docks	80-81	14.9
Computer Room	84-85	8.8
Control Room	85-86	7.5
Secondary Parcel Sorting Machine	84-85	8

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